AMENDMENTS TO THE CLAIMS

1 (Currently amended). A system for circulating blood in a patient comprising:

a cannula assembly comprising an outer cannula sized and configured to extend through an incision into the vena cava or the right atrium and adapted to provide blood intake at a first location in the vena cava or the right atrium and an inner cannula sized and configured to be slidably received within the outer cannula, the inner and outer cannulas forming between them a lumen defining a first flow path, the inner cannula defining a second flow path and being sized and configured to extend beyond the outer cannula to provide blood output at a second location in the pulmonary artery; and

a reverse flow pump, at least of portion of which is sized and configured for placement within a chest cavity, communicating with the first and second flow paths and operating to intake blood in a first direction downstream of the pump through the first flow path at the first location and to output blood in a reverse direction through the second flow path at the second location, thereby bypassing blood inflow from the right ventricle and the left ventricle;

wherein the pump and cannula assembly, including the first flow path and the second flow path, having a combined priming volume external of the heart, vena cava, and pulmonary artery of not greater than about 1000 ml.

2 (Previously presented). A system according to claim 1 or 47

wherein the priming volume is not greater than about 30 ml.

3 (Previously presented). A system according to claim 1 or 47

wherein the priming volume is not greater than about 10 ml.

4 (Previously presented). A system according to claim 1

wherein the length of the inner cannula is adapted to extend through the tricuspid valve, through the pulmonary valve, and into the pulmonary artery.

5 (Previously presented). A system according to claim 47

wherein the length of the inner cannula is adapted to extend through the bicuspid valve, through the aortic valve, and into the aorta.

6 (Canceled).

7 (Previously presented). A system according to claim 1 or 47

wherein the first and second flow paths are linear and adapted for insertion at a first end into a heart chamber or blood vessel and at a second end into a blood vessel.

8 (Canceled).

9 (Canceled).

10 (Previously presented). A system according to claim 1 or 47

wherein the pump is coupled to the first and second flow paths of the cannula assembly external of the heart.

11 (Previously presented). A system according to claim 1

wherein the pump is adapted to convey blood from the vena cava or right atrium through the cannula assembly into the pulmonary artery.

12 (Previously presented). A system according to claim 47

wherein the pump is adapted to convey blood from the pulmonary vein through the cannula assembly into the aorta.

13 (Previously presented). A system according to claim 1 further comprising:

a second cannula assembly adapted to extend through an incision in the pulmonary vein or the left atrium and into the aorta, and a second pump adapted to convey blood from the pulmonary vein or left atrium through the second cannula assembly into the aorta.

14 (Previously presented). A system according to claim 1 or 47 further comprising

a controller coupled to the pump for controlling the pump speed.

15 (Previously presented). A system according to claim 13 further comprising

a controller for the first pump and the second pump for controlling the speed of each pump separately.

16 (Previously presented). A system according to claim 14

wherein the controller is adapted to control the pump in response to blood pressure, blood oxygen level, blood carbon dioxide level or blood flow volume.

17 (Previously presented). A system according to claim 15

wherein a controller is adapted to control the first pump in response to pulmonic pressure and a controller is adapted to control the second pump in response to aortic pressure.

18 (Previously presented). A system according to claim 1 or 47 further comprising

a cradle adapted for supporting the heart while displaced from its normal position and while the surgery is performed thereon.

19-46 (Canceled).

47 (Currently amended). A system for circulating blood in a patient comprising:

a cannula assembly comprising an outer cannula sized and configured to extend through an incision into the pulmonary vein or the left atrium and adapted to provide blood intake at a first location in the pulmonary vein or the left atrium and an inner cannula sized and configured to be slidably received within the outer cannula, the inner and outer cannulas forming between them a lumen defining a first flow path, the inner cannula defining a second flow path and being sized and configured to extend beyond the outer cannula to provide blood output at a second location in the aorta; and

a reverse flow pump, at least of portion of which is sized and configured for placement within a chest cavity, communicating with the first and second flow paths and operating to intake blood in a first direction downstream of the pump through the first flow path at the first location and to output blood in a reverse direction through the second flow path at the second location, thereby bypassing blood inflow from the right ventricle and the left ventricle;

wherein the pump and cannula assembly, including the first flow path and the second flow path, having a combined priming volume external of the heart, pulmonary vein, and aorta of not greater than about 1000 ml.

48-49 (Canceled).